



February 02, 2015

LT Environmental, Inc.

Justin Solomon

4600 West 60th Avenue

Arvada

CO 80003

Project Name - KMG - Vonderlage 29N

Project Number - 014211290-0332

Attached are your analytical results for KMG - Vonderlage 29N received by Origins Laboratory, Inc. January 26, 2015. This project is associated with Origins project number X501278-01.

The analytical results in the following report were analyzed under the guidelines of EPA Methods. These methods are identified as follows; "SW" are defined in SW-846, "EPA" are defined in 40CFR part 136 and "SM" are defined in the most current revision of Standard Methods For the Examination of Water and Wastewater.

The analytical results apply specifically to the samples and analyses specified per the attached Chain of Custody. As such, this report shall not be reproduced except in full, without the written approval of Origin's laboratory.

Unless otherwise noted, the analytical results for all soil samples are reported on a wet weight basis. All analytical analyses were performed under NELAP guidelines unless noted by a data qualifier.

Any holding time exceedances, deviations from the method specifications or deviations from Origins Laboratory's Standard Operating Procedures are outlined in the case narrative.

Thank you for selecting Origins for your analytical needs. Please contact us with any questions concerning this report, or if we can help with anything at all.

Origins Laboratory, Inc.
303.433.1322
o-squad@oelabinc.com



1725 Elk Place, Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

CROSS REFERENCE REPORT

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Pad Comp	X501278-01	Soil	January 26, 2015 10:05	01/26/2015 15:33
Off N	X501278-02	Soil	January 26, 2015 10:15	01/26/2015 15:33
Off E	X501278-03	Soil	January 26, 2015 10:20	01/26/2015 15:33
Off S	X501278-04	Soil	January 26, 2015 10:25	01/26/2015 15:33
Off W	X501278-05	Soil	January 26, 2015 10:30	01/26/2015 15:33
Off Comp	X501278-06	Soil	January 26, 2015 10:10	01/26/2015 15:33

Origins Laboratory, Inc.



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Jen Pellegrini For Noelle Doyle Mathis, President

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

ORIGINS

LABORATORY, INC

www.originslaboratory.com

X501278

page 1 of 1

Client: LT Environmental
 Address: 4200 W. 60th Ave.
Arvada, CO 80003
 Telephone Number: 303-433-9788
 Email Address: jsolomon@ltenv.com

Project Manager: J. Solomon
 Project Name: KMk Underage 29W
 Project Number: 0142129D-0332
 Samples Collected By: W. Baldwin

Sample ID Description	Date Sampled	Time Sampled	# of Containers	Preservative				Matrix			Analysis	Sample Instructions			
				Unpreserved	HCl	HNO ₃	Other	Groundwater	Soil	Air Summa #			Other		
Pad Camp	1/20/15	1005	3	X					X				1	X	Ascorbic Acid
04 N		1015	1										2	X	Ascorbic Acid
04 E		1020	1										3	X	Ascorbic Acid
04 S		1025	1										4	X	Ascorbic Acid
04 W		1030	1										5	X	Ascorbic Acid
04 Camp		1010	2										6	X	Ascorbic Acid
													7		
													8		
													9		
													10		
Relinquished By: <u>W Baldwin</u>	Date: <u>1/20/15</u>	Time: <u>1533</u>	Received By: <u>gaff</u>	Date: <u>1/21/15</u>	Time: <u>1533</u>	Turnaround Time: <input type="checkbox"/> 24 Hr <input type="checkbox"/> 48 Hr <input checked="" type="checkbox"/> Standard									

1725 Elk Place | Denver, CO 80211 | Phone: 303.433.1322 | Fax: 303.265.9645

Temp Received - 7.3

Date Results Needed

Origins Laboratory, Inc.

Jeff Pellipini

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Origins Laboratory

F-012207-01-R1
Effective Date: 01/09/12

Sample Receipt Checklist

Origins Work Order: X501278

Client: LTE

Client Project ID: Vonderlage 29N

Checklist Completed by: Jeff Smith

Shipped Via: H/D
(UPS, FedEx, Hand Delivered, Pick-up, etc.)

Date/time completed: 1/26/13

Airbill #: NA

Matrix(s) Received: (Check all that apply): X Soil/Solid Water Other:

Cooler Number/Temperature: 1 / 2.3 °C / °C / °C (Describe)

Thermometer ID: T003

Requirement Description	Yes	No	N/A	Comments (if any)
If samples require cooling, was the temperature between 0°C to ≤ 6°C ⁽¹⁾ ?	X			
Is there ice present (document if blue ice is used)	X			
Are custody seals present on cooler? (if so, document in comments if they are signed and dated, broken or intact)		X		
Are custody seals present on each sample container? (if so, document in comments if they are signed and dated, broken or intact)		X		
Were all samples received intact ⁽¹⁾ ?	X			
Was adequate sample volume provided ⁽¹⁾ ?	X			
Are short holding time analytes or samples with HTs due within 48 hours present ⁽¹⁾ ?	X			
Is a chain-of-custody (COC) present and filled out completely ⁽¹⁾ ?	X			
Does the COC agree with the number and type of sample bottles received ⁽¹⁾ ?	X			
Do the sample IDs on the bottle labels match the COC ⁽¹⁾ ?	X			
Is the COC properly relinquished by the client with date and time recorded ⁽¹⁾ ?	X			
For volatiles in water – is there headspace (> ¼ inch bubble) present? If yes, contact client and note in narrative.			X	
Are samples preserved that require preservation and was it checked ⁽¹⁾ ? (note ID of confirmation instrument used in comments) / (preservation is not confirmed for subcontracted analyses in order to insure sample integrity)/pH <2 for samples preserved with HNO ₃ , HCL, H ₂ SO ₄ / (pH >10 for samples preserved with NaAsO ₂ +NaOH, ZnAc+NaOH)			X	
Additional Comments (if any):				

⁽¹⁾ If NO, then contact the client before proceeding with analysis and note date/time and person contacted as well as the corrective action to in the additional comments (above) and the case narrative.

Reviewed by (Project Manager)

Date/Time Reviewed

Origins Laboratory, Inc.

Jeff Pellegrini

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4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Pad Comp**1/26/2015 10:05:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X501278-01 (Soil)**BTEX by EPA 8260C**

Benzene	ND	0.002	mg/kg	1	5A27008	01/27/2015	01/27/2015
Toluene	ND	0.002	"	"	"	"	"
Ethylbenzene	ND	0.002	"	"	"	"	"
Xylenes, total	ND	0.002	"	"	"	"	"

Surrogate: 1,2-Dichloroethane-d4	95.0 %	70-130			"	"	"
Surrogate: Toluene-d8	98.7 %	70-130			"	"	"
Surrogate: 4-Bromofluorobenzene	95.7 %	70-130			"	"	"

pH in Soil by EPA 9045D

pH	7.52		pH Units	1	5A28008	01/28/2015	01/29/2015
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SAR Metals by SW846 3050B/6010C

Calcium	3610	24.3	mg/kg dry	1	1453515	01/28/2015	01/28/2015
Magnesium	2420	29.1	"	"	"	"	"
Sodium	264	24.3	"	"	"	"	"

Sodium Adsorption Ratio

Sodium Adsorption Ratio	0.834		none	1	1454635		02/02/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.259		mmhos/cm	1	5A28011	01/28/2015	01/28/2015
Origins Laboratory, Inc.							



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Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Pad Comp**1/26/2015 10:05:00AM**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X501278-01 (Soil)**TCLP Metals by 1311/3010A/6010C**

Arsenic	ND	0.300	mg/L	1	1453819	01/29/2015	01/29/2015	U
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Total Metals by SW846 3050B/6010C

Arsenic	3.79	2.91	mg/kg dry	1	1453514	01/28/2015	01/28/2015	
Barium	121	0.485	"	"	"	"	"	

TPH-Carbon Chain by EPA Method 8015C

Gasoline (C6-C10)	ND	50	mg/kg	1	5A27007	01/27/2015	01/28/2015	
Diesel (C10-C28)	ND	50	"	"	"	"	"	
Residual Range Organics (C28-C36)	ND	200	"	"	"	"	"	

Surrogate: o-Terphenyl	88.9 %	65-146			"	"	"	
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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Justin Solomon

Project Number: 014211290-0332

Project: KMG - Vonderlage 29N

Off N

1/26/2015 10:15:00AM

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit						

GEL Laboratories, LLC

X501278-02 (Soil)

Total Metals by SW846 3050B/6010C

Arsenic	3.94	3.35	mg/kg dry	1	1453514	01/28/2015	01/28/2015
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Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Off E

1/26/2015 10:20:00AM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

GEL Laboratories, LLC
X501278-03 (Soil)

Total Metals by SW846 3050B/6010C

Arsenic	2.64	3.08	mg/kg dry	1	1453514	01/28/2015	01/28/2015	J
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Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Off S

1/26/2015 10:25:00AM

Analyte	Result	Reporting		Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit							

GEL Laboratories, LLC
X501278-04 (Soil)

Total Metals by SW846 3050B/6010C

Arsenic	4.51	3.01	mg/kg dry	1	1453514	01/28/2015	01/28/2015
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Origins Laboratory, Inc.



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LT Environmental, Inc.

4600 West 60th Avenue

Arvada CO 80003

Justin Solomon

Project Number: 014211290-0332

Project: KMG - Vonderlage 29N

Off W

1/26/2015 10:30:00AM

Analyte	Result	Reporting	Units	Dilution	Batch	Prepared	Analyzed	Notes
		Limit						

GEL Laboratories, LLC

X501278-05 (Soil)

Total Metals by SW846 3050B/6010C

Arsenic	2.69	3.33	mg/kg dry	1	1453514	01/28/2015	01/28/2015	J
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Origins Laboratory, Inc.



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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Off Comp
1/26/2015 10:10:00AM

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Notes
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Origins Laboratory, Inc.
X501278-06 (Soil)

pH in Soil by EPA 9045D

pH	8.03		pH Units	1	5A28008	01/28/2015	01/29/2015
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SAR Metals by SW846 3050B/6010C

Calcium	6220	26.7	mg/kg dry	1	1453515	01/28/2015	01/28/2015
Magnesium	2000	32.0	"	"	"	"	"
Sodium	69.5	26.7	"	"	"	"	"

Sodium Adsorption Ratio

Sodium Adsorption Ratio	0.196		none	1	1454635		02/02/2015
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Specific Conductance by Modified 9050A

Specific Conductance (EC)	0.242		mmhos/cm	1	5A28011	01/28/2015	01/28/2015
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Total Metals by SW846 3050B/6010C

Arsenic	3.42	3.20	mg/kg dry	1	1453514	01/28/2015	01/28/2015
Barium	89.3	0.534	"	"	"	"	"

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Project: KMG - Vonderlage 29N

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5A27008 - EPA 5030 (soil)

Blank (5A27008-BLK1)

Prepared: 01/27/2015 Analyzed: 01/27/2015

Benzene	ND	0.002	mg/kg							
Toluene	ND	0.002	"							
Ethylbenzene	ND	0.002	"							
Xylenes, total	ND	0.002	"							
Surrogate: 1,2-Dichloroethane-d4	57		ug/kg	62.5	91.8	70-130				
Surrogate: Toluene-d8	61		"	62.5	98.1	70-130				
Surrogate: 4-Bromofluorobenzene	62		"	62.5	98.6	70-130				

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Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5A27008 - EPA 5030 (soil)										
LCS (5A27008-BS1)					Prepared: 01/27/2015 Analyzed: 01/27/2015					
Benzene	0.103	0.002	mg/kg	0.100		103	77.1-124			
Toluene	0.104	0.002	"	0.100		104	74.5-128			
Ethylbenzene	0.108	0.002	"	0.100		108	66.4-127			
m,p-Xylene	0.221	0.004	"	0.200		110	76.6-124			
o-Xylene	0.107	0.002	"	0.100		107	76.6-124			
Surrogate: 1,2-Dichloroethane-d4	53		ug/kg	62.5		85.5	70-130			
Surrogate: Toluene-d8	61		"	62.5		97.3	70-130			
Surrogate: 4-Bromofluorobenzene	60		"	62.5		95.6	70-130			

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Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5A27008 - EPA 5030 (soil)

Matrix Spike (5A27008-MS1)		Source: X501275-01			Prepared: 01/27/2015 Analyzed: 01/27/2015					
Benzene	0.048	0.002	mg/kg	0.100	ND	48.3	71.8-126			QM-07
Toluene	0.050	0.002	"	0.100	ND	49.9	65.1-130			QM-07
Ethylbenzene	0.052	0.002	"	0.100	ND	51.7	62.2-130			QM-07
m,p-Xylene	0.101	0.004	"	0.200	ND	50.3	46.5-137			QM-07
o-Xylene	0.051	0.002	"	0.100	ND	51.1	54.2-134			QM-07
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		92.2	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.0	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.4	70-130			

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Project: KMG - Vonderlage 29N

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control
Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5A27008 - EPA 5030 (soil)

Matrix Spike Dup (5A27008-MSD1)		Source: X501275-01			Prepared: 01/27/2015 Analyzed: 01/27/2015					
Benzene	0.062	0.002	mg/kg	0.100	ND	61.5	71.8-126	24.0	11.3	QM-07
Toluene	0.060	0.002	"	0.100	ND	60.1	65.1-130	18.6	15.4	QM-07
Ethylbenzene	0.066	0.002	"	0.100	ND	65.6	62.2-130	23.7	19.6	QM-07
m,p-Xylene	0.128	0.004	"	0.200	ND	64.2	46.5-137	24.3	19.2	QM-07
o-Xylene	0.064	0.002	"	0.100	ND	63.9	54.2-134	22.3	17.9	QM-07
Surrogate: 1,2-Dichloroethane-d4	58		ug/kg	62.5		93.3	70-130			
Surrogate: Toluene-d8	60		"	62.5		96.7	70-130			
Surrogate: 4-Bromofluorobenzene	59		"	62.5		94.3	70-130			

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Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Volatile Organic Compounds by GC/MS SW846 8260C - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Extractable Petroleum Hydrocarbons by 8015M - Quality Control

Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch 5A27007 - EPA 3580

Blank (5A27007-BLK1)

Prepared: 01/27/2015 Analyzed: 01/27/2015

Gasoline (C6-C10)	ND	50	mg/kg
Diesel (C10-C28)	ND	50	"
Residual Range Organics (C28-C36)	ND	200	"

Surrogate: o-Terphenyl

55.2

"

50.0

110

65-146

LCS (5A27007-BS1)

Prepared: 01/27/2015 Analyzed: 01/27/2015

Gasoline (C6-C10)	920	50	mg/kg	1000	92.3	66.7-119
Diesel (C10-C28)	940	50	"	1000	94.1	70.1-127
Residual Range Organics (C28-C36)	1100	200	"	1000	108	54.5-139

Surrogate: o-Terphenyl

51.2

"

50.0

102

65-146

Matrix Spike (5A27007-MS1)

Source: X501272-01

Prepared: 01/27/2015 Analyzed: 01/27/2015

Gasoline (C6-C10)	810	50	mg/kg	1000	23	78.5	56.4-132
Diesel (C10-C28)	820	50	"	1000	16	80.7	57.4-138
Residual Range Organics (C28-C36)	960	200	"	1000	20	93.6	47.7-129

Surrogate: o-Terphenyl

41.4

"

50.0

82.9

65-146

Matrix Spike Dup (5A27007-MSD1)

Source: X501272-01

Prepared: 01/27/2015 Analyzed: 01/27/2015

Gasoline (C6-C10)	890	50	mg/kg	1000	23	87.1	56.4-132	10.1	22
Diesel (C10-C28)	920	50	"	1000	16	90.2	57.4-138	11.0	18.3
Residual Range Organics (C28-C36)	1100	200	"	1000	20	105	47.7-129	11.2	30.1

Surrogate: o-Terphenyl

48.1

"

50.0

96.2

65-146

Origins Laboratory, Inc.



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4600 West 60th Avenue
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Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Classical Chemistry Parameters - Quality Control Origins Laboratory, Inc.

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 5A28008 - NO PREP										
Duplicate (5A28008-DUP1)		Source: X501294-01			Prepared: 01/28/2015 Analyzed: 01/28/2015					
pH	7.08		pH Units		7.07			0.113	25	
Batch 5A28011 - NO PREP										
Blank (5A28011-BLK1)		Prepared: 01/28/2015 Analyzed: 01/28/2015								
Specific Conductance (EC)	0.00290		mmhos/cm							
Duplicate (5A28011-DUP1)		Source: X501275-01			Prepared: 01/28/2015 Analyzed: 01/28/2015					
Specific Conductance (EC)	0.476		mmhos/cm		0.469			1.48	25	

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Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

TCLP Metals by 1311/3010A/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1453819 - SW846 3010A										
MS (1203253097 S)		Source: 365877001			Prepared: 01/29/2015 Analyzed: 01/29/2015					
Arsenic	4.99	0.300	mg/L	5.00	<0.050	99.9	75-125			
TB (1203253098-BLK)					Prepared: 01/29/2015 Analyzed: 01/29/2015					
Arsenic	ND	0.300	mg/L				-			U
TB (1203253544-BLK)					Prepared: 01/29/2015 Analyzed: 01/29/2015					
Arsenic	ND	0.300	mg/L				-			U
BLANK (1203253905-BLK)					Prepared: 01/29/2015 Analyzed: 01/29/2015					
Arsenic	ND	0.300	mg/L				-			U
LCS (1203253906-BKS)					Prepared: 01/29/2015 Analyzed: 01/29/2015					
Arsenic	4.79	0.300	mg/L	5.00		95.8	80-120			
DUP (1203253907 D)		Source: 365877001			Prepared: 01/29/2015 Analyzed: 01/29/2015					
Arsenic	ND	0.300	mg/L		<0.050		0-20	NR	20	U

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LT Environmental, Inc.
4600 West 60th Avenue
Arvada CO 80003

Justin Solomon
Project Number: 014211290-0332
Project: KMG - Vonderlage 29N

Total Metals by SW846 3050B/6010C - Quality Control
GEL Laboratories, LLC

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1453514 - SW846 3050B										
BLANK (1203253125-BLK)					Prepared: 01/28/2015 Analyzed: 01/28/2015					
Barium	0.136	0.484	mg/kg				-			J
Arsenic	ND	2.91	"				-			U
LCS (1203253126-BKS)					Prepared: 01/28/2015 Analyzed: 01/28/2015					
Barium	50.6	0.498	mg/kg	49.8		102	80-120			
Arsenic	50.7	2.99	"	49.8		102	80-120			
DUP (1203253127 D)					Source: 365877001		Prepared: 01/28/2015 Analyzed: 01/28/2015			
Arsenic	5.10	3.22	mg/kg dry		4.69		0-20	8.53	20	
Barium	2810	2.68	"		3320		0-20	16.8	20	
MS (1203253128 S)					Source: 365877001		Prepared: 01/28/2015 Analyzed: 01/28/2015			
Arsenic	58.3	3.23	mg/kg dry	53.8	4.69	99.7	75-125			
Barium	3170	2.69	"	53.8	3320	0	75-125			

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Notes and Definitions

U Result not detected above the detection limit

QM-07 The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

N Spiked sample recovery not within control limits

J Greater than the detection limit but less than the reporting limit

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

All soil results are reported at a wet weight basis.

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Jen Pellegrini For Noelle Doyle Mathis, President